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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/520,364

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EXAMINER

METZMAIER, DANIEL S

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

02/26/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,364

Applicant(s)

KESZLER ET AL.

Examiner

Daniel S. Metzmaier

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/3; 4/26; 2/23/2007 & 1/3/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 49-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-17, 19-28, 31-38, 41-47 and 60 is/are rejected.
- 7) ☒ Claim(s) 9, 10, 18, 29, 30, 39, 40 and 48 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-846)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/3/05; 2/23/07 & 4/26/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-60 are pending.

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-11, 15-31, 33-41, 45-46 and 48, and the species, $\text{La}_{0.7}\text{Y}_{0.3}\text{Sc}_3(\text{BO}_3)_4$, in the reply filed on 03 December 2007 is acknowledged. The traversal is on the ground(s) that claim 60 should be included in Group I, Group II should be included with Group I, and the Peterson et al does not read on the instant claims. This is not found persuasive because Peterson et al does read on claim 12, although claim 12 is an improper claim. Furthermore, claim 1 reads on $\text{LaSc}_3(\text{BO}_3)_4$ described in the introduction section of the Peterson et al reference.

Group II has been collapsed with Group I. Claims 1-48 and 60 have been examined on the merits.

The requirement is still deemed proper and is therefore made FINAL.

Claims 49-59 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in the reply filed on 03 December 2007.

Information Disclosure Statement

2. The information disclosure statement filed 03 January 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the

application file, but the information referred to therein has not been considered.

Applicants do not provide a copy of the ROC patent cited. The abstract was cited on the PTO-892 attached to the Office Action of 02 October 2007.

3. The information disclosure statement filed 26 April 2007 and 23 February 2007 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the citations do not provide a place of publication.

See 37 CFR 1.98(b)(5): "Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication."

It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Drawings

4. The drawings received on 03 January 2005 are acceptable.

Claim Objections

5. Claims 4, 6-7 and 12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s)

in proper dependent form, or rewrite the claim(s) in independent form. Claims 6, 7 and 12 include species that are not provided for in claim 1 by the lanthanides of claims 4 and 12 and the values of x, y and z of claims 6-7.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4-6 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 4, it is unclear how M or M' could possibly be Ce (cerium) since it is not provided for in claim 1. Furthermore, "the remaining metal" lacks proper antecedent basis in claim 1. It is unclear what "remaining metal applicants are referring.

In claim 6, the alternative grouping in the last two lines is indefinite. Said alternative grouping employs closed language, *i.e.*, "selected from the group consisting of", followed by open language, *i.e.*, "including". It is unclear if Ce and Pm are intended in the claimed species. In claim 6, "M_x" lacks proper antecedent basis.

In claim 32, in the formula set forth, the values of Ln and Ln' are undefined in the claim and do not correspond to a specific element.

Claim interpretation

8. In at least some of the claims, e.g., claim 3, M and M' are not required in claim 1, *i.e.*, "where x from about zero to about 1". When x = about 0, M and M' do not exist. Certain dependent claims are rejected under prior art while the independent claim is not

since dependent claims are broader than the independent claim. Applicants may anticipate a rejection of the independent claim if amended to the breadth of the broader dependent claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-6, 11-13, 15, 17, 19-27, 31-33, 41-43 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruber et al, "*Spectroscopic Properties of nonlinear NdSc₃(BO₃)₄*", Journal of Applied Physics, Vol. 87, No. 10, 15 May 2000. Gruber et al (page 7159, Introduction) discloses LaSc₃(BO₃)₄ having spectroscopic properties as laser host materials that reads on the claimed borate crystals. See also page 257, which discloses PrSc₃(BO₃)₄ having a R32 structure.

Please see Gruber et al at page 7159, II. Experimental Details, wherein the crystals were mounted on glass fiber with epoxy. Said disclosure reads on the composition claims.

In claims 3-5, M and M' are not required. In claim 6, M_y may be La.

11. Claims 1, 3-5, 15, 19-22, 24, and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Masaki et al, US 5,879,803. See figure 1 and column 3, lines 10-

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15. Masaki et al discloses $\text{Sc}_2\text{O}_3 + \text{ScBO}_3$. Since M and M' can be Sc, the structure reads on $\text{Sc}_4(\text{BO}_3)_4$ or as a normalized structure ScBO_3 .

12. Claims 1-7, 11-17, 33-37 and 41-47 are rejected under 35 U.S.C. 102(a) as being anticipated by Durmanov S.T. et al, "Binary rare-earth scandium borate for diode-pumped lasers" Optical Materials, 18, (Nov-2001, 243-284. Durmanov S.T. et al (tables 2 and 4) discloses compounds of $\text{La}_{0.85}\text{Pr}_{0.21}\text{Sc}_{2.94}(\text{BO}_3)_{3.8}$ and $\text{LaSc}_{2.85}\text{Yb}_{0.15}(\text{BO}_3)_{3.8}$. Durmanov S.T. et al (page 280-281) discloses Er and Yb dopes LSB crystals having applicability in lasers. The properties would have been inherent to the otherwise anticipated compounds.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1-8, 11-15, 17, 19-28, 31-38, 41-45, 47 and 60 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kuz'min O.V. et al. "*Cerium scandium borate - an active nonlinear medium for diode-pumped lasers*", Quantum Electronics, 28(1) 1998, 50-54. Kuz'min O.V. et al (page 50, Introduction et seq) discloses non-linear optical materials composed of crystals of double borates having the formula $RX_3(BO_3)_4$, wherein $R = Y$, La or lanthanides and $X = Al, Ga, Sc$. Kuz'min O.V. et al (page 53) discloses the formation of layered materials for use in lasers.

Kuz'min O.V. et al clearly envisages compounds, compositions and lasers employing $LaSc_3(BO_3)_4$, $YSc_3(BO_3)_4$ or $LnSc_3(BO_3)_4$, wherein Ln are mixed or sole lanthanides. Kuz'min O.V. et al (page 50, right column) disclose mixed lanthanide scandium borates, wherein the lanthanides (Ln) sum to a subscript of 1 in the formula $LnSc_3(BO_3)_4$, wherein Ln are mixed lanthanides.

To the extent that Kuz'min O.V. et al differs from the claims in the sufficiency of the disclosure as claimed, it would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ $R = La, Y$ or mixed La and Y with $X = Sc$ as an obvious choice for the advantage of forming non-linear optical crystals for laser applications as taught in the Kuz'min O.V. et al reference.

16. Claims 1-7, 11-17, 19-22, 24-27, 31-37 and 41-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durmanov S.T. et al, "*Binary rare-earth scandium borate for diode-pumped lasers*" Optical Materials, 18, (Nov-2001, 243-284. Durmanov S.T. et al (tables 2 and 4) discloses compounds of $La_{0.85}Pr_{0.21}Sc_{2.94}(BO_3)_{3.8}$ and

LaSc_{2.85}Yb_{0.15}(BO₃)_{3.8}. Durmanov S.T. et al (page 280-281) discloses Er and Yb doped LSB crystals having applicability in lasers.

To the extent the Durmanov S.T. et al differs from the claims in the sufficiency of the disclosed compounds, compositions, devices, and/or properties, Durmanov S.T. et al discloses materials which are the same or substantially the same as those instantly claimed and would be expected to have the same or substantially the same properties. A compound and all of its properties are generally inseparable. *In re Papsech*, 315 F.2d. 381, 137 USPQ 43, (CCPA 1963).

Furthermore and to the extent the ratios of elements vary slightly from those claimed, See also MPEP 2144.05(I) wherein it sets forth, "A *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)."

Durmanov S.T. et al (page 277) discloses a laser diode setup, which would have included a second material as part of the setup.

17. Claims 1, 3-8, 12-15, 19-22, 24-28, 32 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huguenin et al, US 6,238,593. Huguenin et al (abstract; column 3, lines 15 et seq; examples and claims) disclose lanthanide or rare earth borate materials and the use of said materials (column 5, lines 32-44) in well known silk-screen printing operations for use in luminescent devices, which would clearly and/or implicitly would require a second material, e.g., binder and/or coupling

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agent. Huguenin et al (column 3, line 16) clearly contemplates mixtures of rare earth materials in the disclosure of "Ln representing at least one rare-earth". Huguenin et al (column 4, lines 1-5) discloses the rare-earths that may be used as Ln include Y, Gd, La, Lu and Sc.

Huguenin et al differs from the claims in the sufficiency of the disclosure of the ratios defining the mixed rare-earths claimed.

Huguenin et al (column 4) disclose varying the rare-earth combination for the advantage of varying the emission intensity at various wavelengths.

It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to employ mixtures of rare-earths including lanthanum (La) and/or scandium (Sc) in the disclosed luminescent compounds and compositions disclosed in the Huguenin et al reference for their luminescent properties.

Allowable Subject Matter

18. Claims 9-10, 18, 29-30, 39-40 and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Peterson et al, "Stoichiometric, trigonal, huntite borate $CeSc_3(BO_3)_4$ ", International Journal of Inorganic Materials 2 (2000) pp. 101-106, is

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considered cumulative to Gruber et al, "*Spectroscopic Properties of nonlinear NdSc₃(BO₃)₄*", Journal of Applied Physics, Vol. 87, No. 10, 15 May 2000 for at least claims 15 and 17.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David W. Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel S. Metzmaier/
Primary Examiner, Art Unit 1796

DSM